

# PATENT SPECIFICATION



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547,375

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## PROVISIONAL SPECIFICATION

### Improvements in and relating to Flexible Couplings for Pipes and the like

We, METALASTIK LIMITED, a British Company, of Evington Valley Road, Leicester, ALFRED GEORGE BARRETT, a British Subject, and MAX GOLDSCHMIDT, 5 of German Nationality, both of the Company's address, do hereby declare the nature of this invention to be as follows:—

The invention relates to flexible couplings for pipes and the like which are employed with the purpose of introducing an elastic or flexible unit between adjacent ends of rigid pipes with the object of preventing the transmission of sound along 10 the pipe system.

In a metallic pipe system the pulsations arising from a pump or the like or the movements of liquid in the pipe system such as water hammer effect set up on the 20 closing of cocks or valves in the system are transmitted along the pipes considerable distances. It has been realised, as for example in Patents 487,780 and 519,773, that the effect may be prevented 25 or reduced by the introduction between the pipe sections of elastic coupling members.

In the present improvement in such flexible coupling members, the rubber 30 member is a strong homogeneous body with the metallic rings which are clamped to the metallic flanges or collars of the adjacent pipe ends located within the rubber body in a manner which leaves them 35 completely enclosed so that no metallic contact with the pipe ends is possible except through the usual clamping studs. Also these metallic rings are surrounded by the rubber of the body of the coupling 40 member on the surface which is toward the bore through the member, so that no contact is possible between the metallic rings and any fluid flowing through the pipe system. The metallic clamping rings in 45

the preferred embodiments of the invention will be bonded to the rubber, that is to say the rubber unit will be vulcanised to the surfaces of the metallic rings in a mould by the now well known bonding 50 process. If desired, however, the rubber may be moulded with circular openings of reduced size leading into the annular re-

cesses in which the metallic rings are to be located and the rings can be inserted in place without the bonding process, since 55 quite a good sealing effect is obtained as the parts of the rubber bordering the entrance slots to the recesses form lips which are squeezed when the coupling unit is clamped up in position between adjacent ends of pipes.

In one convenient embodiment of construction the rubber body is of cylindrical form of substantial length with annular recesses moulded in it around a central 60 bore and separated from this bore and from each other by a substantial thickness of rubber. Entering each annular recess at a number of points, say four, corresponding to the number of clamping studs 65 to be used are apertures surrounded by rubber web portions. The metallic rings will be bored and internally screwed to receive the clamping studs which pass through the pipe flanges and these rings 70 will be inserted in place in a mould and the rubber unit is moulded therein with the rings located in the recesses in the rubber coupling body in this preferred embodiment, and the rubber will be 75 bonded by vulcanisation to the metallic surfaces. It is preferred to form on the end face of the rubber unit around each stud aperture a projecting rib which may be curved on the outer face which forms a 80 compressible gasket to assist in the sealing effect of the rubber between the ring in the recess and the pipe end flange. The 85 rib will be raised on the surface of the continuous web around each bolt or stud hole 90 and continue as concentric curved inner and outer parts between these webs, thus forming continuous sealing surfaces all around the end face.

If desired we may use in conjunction 95 with the coupling member a number of flexible straps passing over the coupling member from one attachment stud on one pipe flange to the corresponding stud on the adjacent pipe flange, which straps act 100 as limiting members to restrict excessive extension when the coupling is loaded at substantial pressures. A suitable substance for such limiting straps would be

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canvas impregnated with rubber, and it would be desirable to reinforce the ends of these straps where the holes for passing the clamping studs are arranged with 5 metallic reinforcing plates on each side.

Dated this 23rd day of June, 1941.

BARKER, BRETELL & DUNCAN,  
Chartered Patent Agents,  
75 & 77, Colmore Row, Birmingham, 3.

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## COMPLETE SPECIFICATION

### Improvements in and relating to Flexible Couplings for Pipes and the like

We, METALASTIK LIMITED, a British Company, of Evington Valley Road, Leicester, ALFRED GEORGE BARRETT, a British Subject, and MAX GOLDSCHMIDT, 10 of German Nationality, both of the Company's address, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in 15 and by the following statement:—

The invention relates to flexible couplings for pipes and the like which are employed for the purpose of introducing an elastic or flexible unit between adjacent 20 ends of rigid pipes with the object of preventing the transmission of sound along the pipe system.

In a metallic pipe system the pulsations arising from a pump or the like or the 25 movements of liquid in the pipe system such as water hammer effect set up on the closing of cocks or valves in the system are transmitted along the pipes considerable distances. It has been realised, as for 30 example in Patents 487,780 and 519,773, that the effect may be prevented or reduced by the introduction between the pipe sections of elastic coupling members.

In the present improvement in such 35 flexible coupling members, the rubber member is a strong homogenous body characterised by the rings which are clamped to the flanges or collars of the adjacent pipe ends being located within 40 the rubber body in a manner which leaves them enclosed so that no metallic contact with the pipe ends is possible except through the usual clamping bolts.

As the clamping rings are surrounded 45 by the rubber of the body of the coupling member on the surface which is toward the bore through the member, no contact is possible between the rings which are usually made of metal and any fluid flowing 50 through the pipe system.

The clamping rings in the preferred 55 embodiments of the invention are of metal and will be bonded to the rubber, that is to say the rubber unit will be vulcanised to the surfaces of the metallic rings in a mould by the now well known bonding process.

If desired, however, the rubber may be

moulded with circular slots of reduced size leading into the annular recesses in which 60 the metallic rings are to be located and by flexing the rubber bordering the circular slot at each end, the rings can be inserted into place in the rubber body without the bonding process, since quite a good sealing 65 effect is obtained as the parts of the rubber bordering the entrance slots to the recesses then form lips which are squeezed when the coupling unit is clamped up in position between adjacent ends of pipes.

In the appended drawings three constructional embodiments are illustrated.

Figure 1 is an end elevation of the rubber body of the coupling.

Figure 2 is a vertical section the top 75 half being taken on the line from the centre of Figure 1 to point *a* and the lower half from the centre to point *b*.

Figure 3 is a fragmentary end view illustrating a slightly modified construction.

Figure 4 is an end view of a further constructional embodiment.

Figure 5 is partly a section on a line from *c* to the centre of Figure 4 and partly 85 a side elevation.

In the convenient embodiment of construction shown in Figures 1 and 2 the rubber body 6 is of cylindrical form of substantial length with annular recesses 90 7, 7, moulded in it around a central bore 8 and separated from this bore and from each other by a substantial thickness of rubber. Entering each annular recess 7 at a number of points, say four, corresponding to the number of clamping 95 bolts 9 to be used are apertures 10 surrounded by rubber web portions 11. The metallic rings 12 will be bored and internally screwed as at 13 to receive the 100 clamping bolts which pass through the flanges 14 of the pipe 15 and these rings will be inserted in place in a mould and the rubber unit then moulded therein with the rings 12 located in the recesses 7 in 105 the rubber coupling body 6 in this preferred embodiment, and the rubber will be bonded by vulcanisation to the metallic surfaces. It is preferred to form on each end face of the rubber unit around each 110 stud aperture 10 a projecting rib 16 which

may be curved on the outer face and forms a compressible gasket to assist in the sealing effect of the rubber between the ring in the recess and the pipe end flange. The 5 rib around each bolt hole 10 will be raised on the surface of the continuous web 11, which walls-in the annular recess 7, and the rib preferably is continued as concentric curved inner and outer parts 17 and 18 on the end faces of the body where they meet the pipe flanges, thus forming continuous sealing surfaces all around each end face.

The clamping rings should be radiused 15 at their inner edges to avoid concentrating the stress in the rubber at these points which might be a source of trouble when the coupling stretches under high pressure.

20 As shown in Figure 3 we may mould the rubber coupling body 6 with a continuous circular slot 19 leading into the annular recess 7 and, instead of moulding the coupling around the clamping rings 25 12, we may then insert the rings through the slots into the respective recesses by forcing apart the inner and outer lips 20 and 21 which take the place of the continuous web 11 of the previous example.

30 The ribbing of the end faces previously described may be employed in this construction also, but is not shown in the illustration. Gaps 22 may be formed in the lips where each bolt will come or the 35 lips may be simply deformed by the bolts.

If desired, as shown in Figures 4 and 40 5, we may use in conjunction with the coupling member a number of flexible straps 23 passing over the coupling body 6 from one clamping bolt 9 on one pipe flange 14 to the corresponding bolt 9 on the adjacent pipe flange. These straps act as limiting members to restrict excessive extension when the coupling is 45 loaded at substantial internal pressure.

A suitable substance for such limiting straps 23 is canvas impregnated with rubber, and it is desirable to reinforce the ends of these straps where the holes for 50 passing the clamping bolts 9 are arranged. This may be done by employing thin, metallic reinforcing plates 24 on each side of each end of each strap. The plates may be secured by rivets 26 carried 55 through the strap.

The outer edge of each plate 24 is preferably bent away from the canvas as at

25 to avoid fraying the material.

Otherwise the construction in Figures 4 and 5 resembles that described with reference to Figures 1 and 2.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. A flexible coupling for pipes and the like including a rubber unit with an appropriate bore, wherein the rubber unit of the coupling has annular recesses 70 formed within its body in which the rings, which are to be clamped to the flanges or collars of the adjacent pipe ends, are enclosed and are out of metallic contact with the pipe ends except through the usual 75 clamping bolts.

2. A flexible coupling for pipes and the like including a rubber unit with an appropriate bore, wherein the rubber unit has metal clamping rings embedded in its 80 body, as claimed in claim 1, the rubber being bonded to the rings and the latter being accessible to clamping bolts through apertures formed in the end faces of the rubber unit. 85

3. A coupling for pipes and the like as claimed in claim 1, or in claim 2, in which the end faces of the rubber unit are formed with projecting gasket-ribs which are compressed when the coupling is 90 bolted up between adjacent pipe ends.

4. A coupling for pipes and the like as claimed in claim 1, in which the rubber body is moulded with the annular recesses bordered on the two end faces of the body 95 by lips leaving between them circular slots through which, by flexing the rubber, the clamping rings may be inserted into the recesses.

5. A coupling for pipes and the like as 100 claimed in any preceding claim wherein a number of flexible substantially inextensible straps are passed over the coupling body from one clamping bolt on one pipe flange to a bolt on the adjacent pipe 105 flange, which straps act as limiting members restricting excessive extension when the coupling is under considerable pressure.

Dated this 17th day of June, 1942.  
BARKER, BRETTELL & DUNCAN,  
Chartered Patent Agents,  
75 & 77, Colmore Row, Birmingham, 3.

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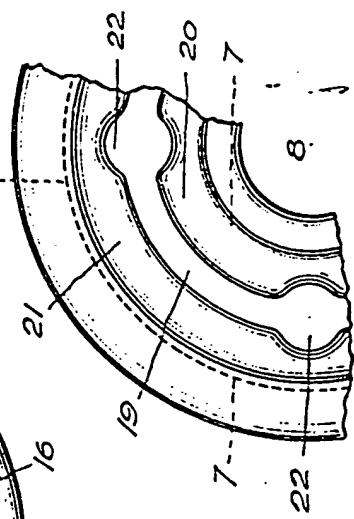
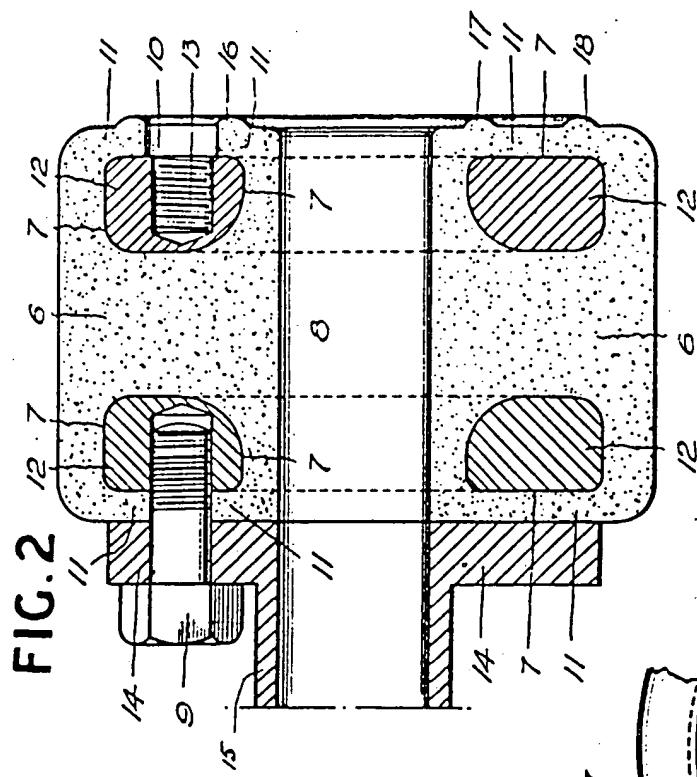
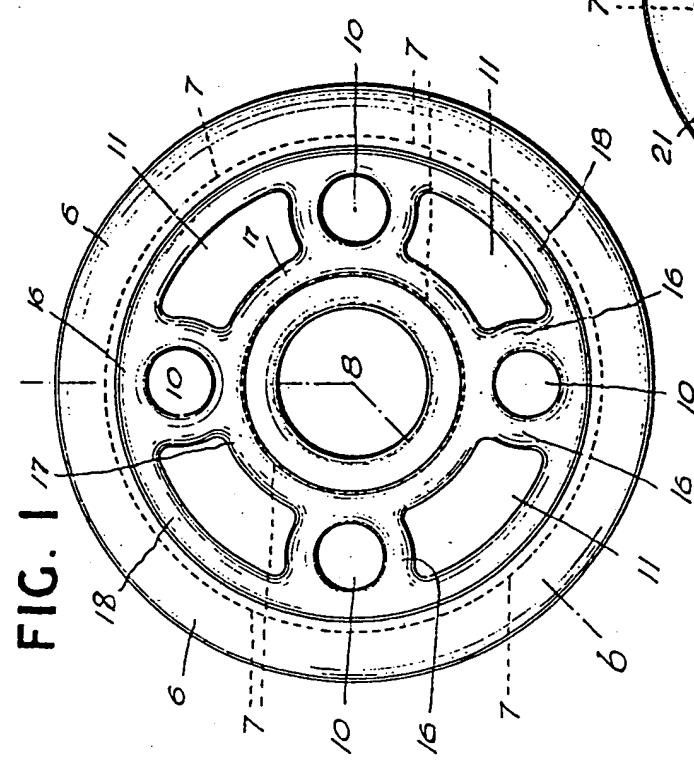


FIG. 4

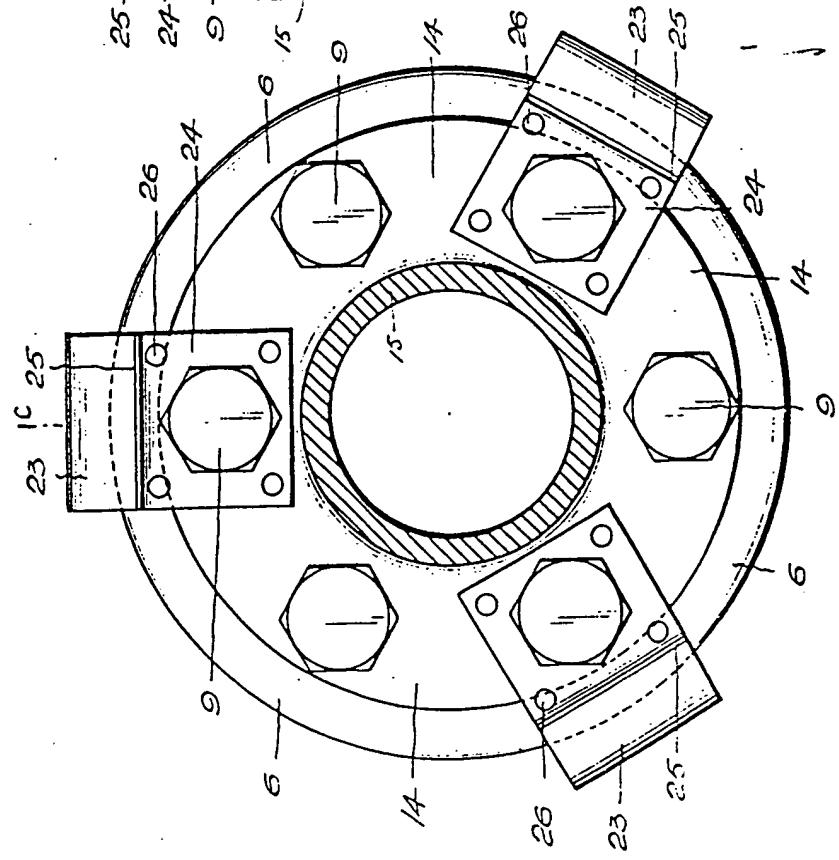
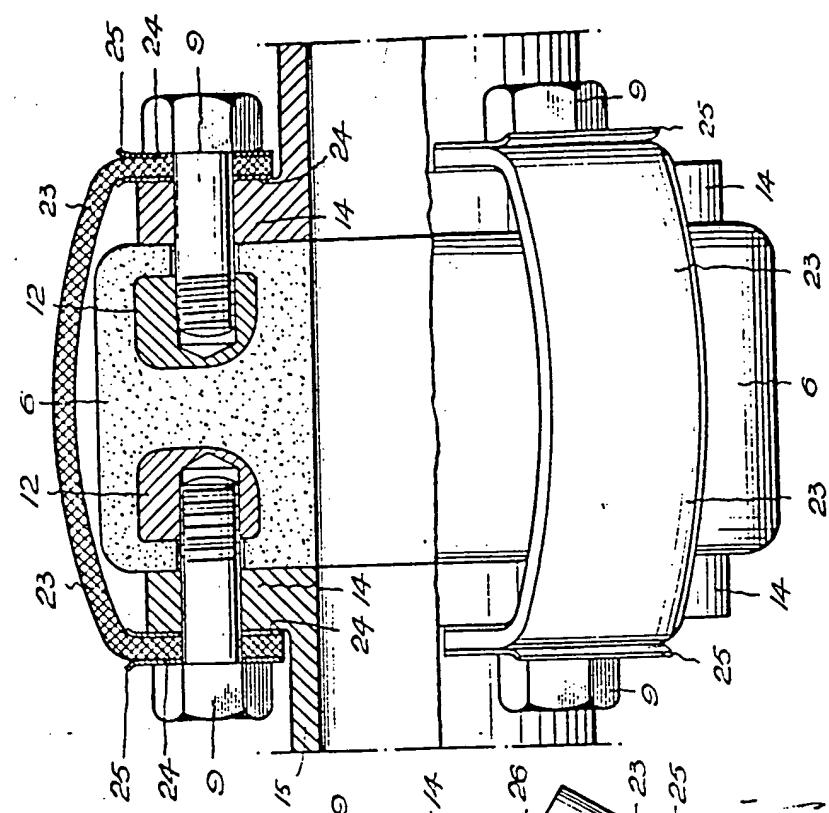


FIG. 5



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